

SECTION 16470

TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS) (SURGE PROTECTIVE DEVICES)

PART 1 - GENERAL

- 1.1 The work required under this division shall include all materials, labor and auxiliaries required to install complete surge suppression for the protection of building electrical and electronic systems from the effects of line and electromagnetic induced transient voltage surges and coupled lightning discharged transients as indicated on drawings and as specified in this section.
- 1.2 STANDARDS
 - A. The following standards and publications referenced in various parts of this specification shall apply.
 - 1. UL 1449 - Second Edition; effective February 16, 1998 Standard for Safety for Transient Voltage Surge Suppressors.
 - 2. ANSI/IEEE C62.41, Recommended Practice for Surge Voltages in Low Voltage AC Power Circuits.
 - 3. NEMA LS-1, Specification Format for Low Voltage AC Surge Protective Devices (1000 volts or less).
 - 4. CSA - C22.2 and NOM Approvals for TVSS.
- 1.3 SUBMITTALS
 - A. Contractor shall provide submittal data as defined in Section [16010] [26 05 00] "ELECTRICAL GENERAL PROVISIONS", and as required in the Division [1] [01] section governing submittal requirements. Also, Contractor shall provide NEMA LS-1 document for submittal to the Engineer.
- 1.4 QUALIFICATIONS
 - A. All surge protective devices shall be manufactured by a single ISO-9001 registered company normally engaged in the design, development and manufacture of such devices for electrical and electronic system equipment protection. The said firm shall offer a ten-year (10) warranty for its hard-wired surge protective devices.
 - B. The surge protective device manufacturer shall offer at no cost technical assistance through support from factory representatives and local authorized distributors and maintain a 24-hour toll free technical support hotline.
 - C. Equipment certification: Items shall be "Listed" by Underwriters Laboratories, Inc. and shall exhibit the UL Listing Mark for the category "Transient Voltage Surge Suppressors" or TVSS. UL Listing Card under category TVSS shall be provided to confirm compliance to UL1449 Second Edition Standard and assigned Suppressed Voltage Ratings.

- D. Surge Protective Devices shall be installed and located in accordance with the requirements of all applicable National Fire Protection Association (NFPA) codes. The device shall be installed on the load-side of the main service disconnect per the scope of UL 1449 Standard for Safety for Transient Voltage Surge Suppressors.
- E. All surge protective devices shall be warranted to be free from defects in materials and workmanship under normal use in accordance with the instructions provided for a period of ten (10) years.
- F. Any surge protective device that exhibits evidence of failure or incorrect operation during the warranty period shall be repaired or replaced by the manufacturer.
- G. Manufacturers shall provide third party nationally recognized national laboratory verification of performance data including Maximum Surge Current testing.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All Surge Protectors shall be designed for the specific type and voltage of the electrical service as indicated on the drawings, and provide suppression for all phases (L-N), all phases (L-G), and (N-G).
- B. All Surge Protectors shall be of a parallel-operated hybrid circuit design and include full cycle tracking clamping capability.
- C. All Surge Protectors shall be designed to withstand a maximum continuous operating voltage (MCOV) rating of not less than 115% of the system rms line voltage to which they are connected.
- D. All Surge Protectors shall provide minimum -30dB noise attenuation across the 5k - 100MHz frequency spectrum.
- E. All Surge Protectors shall contain internal safety fusing to disconnect surge protective components from the electrical source of supply in the event of SPD failure in order to prevent catastrophic failure.
- F. All Surge Protectors shall not allow follow-current or "crow-bar" components, which may disconnect power to connected equipment during surge diversion.
- G. All Surge Protectors shall be UL 1449, 2nd Edition Listed and shall be approved for the location in which they are installed.
- H. All Surge Protectors shall have operating temperature range of -10 to +60 degrees C.
- I. Loss of Protection Diagnostic lights for each phase shall be provided. In addition, separate visual and audible fault indication shall be provided. Provision for remote monitoring shall be provided via a dry contact.
- J. Surge protection devices shall be provided in minimum NEMA 12 enclosures.

- 2.2 REPLACEABLE MODULAR SURGE PROTECTOR MINIMUM RATINGS: (Main Service)
- A. Maximum Surge Current (8x20 us waveform): 200kA (L-N), 200kA (L-G), 200kA (N-G)
UL 1449 SVR: 400V peak (120V), 800V peak (277V)
- 2.3 REPLACEABLE MODULAR SURGE PROTECTOR MINIMUM RATINGS: (Distribution Panels)
- A. Maximum Surge Current (8x20 us waveform): 60kA (L-N), 60kA (L-G), 60kA (N-G) UL
1449 SVR: 400V peak (120V), 800V peak (277V)
- 2.4 ACCEPTABLE MANUFACTURERS
- A. EFI Electronics
- B. LEA International
- C. Current Technology

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Surge Protectors shall be installed as close as practical to the electrical panel or switchboard to be protected. The SPD shall be close coupled to the equipment in a position near the equipment neutral bus bar or positioned so that the overall lead length is as short as possible.
- B. The Surge Protector shall be installed in a manner consistent with proper and acceptable industry wiring practice. SPD connection leads shall be as short and straight as possible while avoiding sharp bends.
- C. Surge Protectors provided with terminals shall be wired with largest stranded conductor permitted within rating of lugs. At least 8 AWG conductor shall be used.
- D. The Surge Protector shall be installed with a means for disconnecting the device for servicing via a dedicated three-pole circuit breaker, size as indicated on the drawings, unless manufacturer's recommendations differ.

END OF TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS) (SURGE PROTECTIVE DEVICES)